while his book will shock a few righteous who need no repentance, and afford erotic stimulus to a few abnormal people to whom even the lilies of the field are "suggestive," it will, we think, be welcomed by teachers, by parents, and by the quite naturally curious adolescents who find in all our highly evolved educational system nothing corresponding with the ancient initiation into the mysteries of sex, and very little corresponding with the ancient disciplines correlated with these.

Dr. Herbert's account of ovum-maturation is no longer quite correct; his reference to Loeb's method of artificial parthenogenesis is not up to date; to call the female organism or sex-cell anabolic and the male katabolic is a false simplicity, for it is a question of ratio, as when Riddle says of pigeons that the ova which show a relatively greater storing capacity and relatively lower intensity of metabolism develop into female organisms. But these are minor points; the bulk of the book is thoroughly competent and sound, and this has been wisely restrained. Its particular excellences are in calling a spade a spade, in considering sex in mankind as the outcome of a long evolution, and in insisting on treating the problems not merely physiologically, but also as problems of psycho-biology.

Insetti delle Case e dell' Uomo e Malattie che diffondono. By Prof. Antonio Berlese. Pp. xii + 293. (Milano: Ulrico Hoepli, 1917.) Price 4.50 lire.

PROF. BERLESE's interesting manual deals with the insects and arachnids found in Europe attacking man or damaging his food and belongings. After considering those—lice, bugs, fleas, mosquitoes, Phlebotomus, Stomoxys, and ticks—which suck the blood of man, he proceeds in the two following chapters to give an account of house-flies, blowflies, etc., and of such household pests as cockroaches, psocids, Lepisma, moths, and mites. Under most of the species there is a short description of the adult and of the life-history and habits, and suggestions for the application of deterrents and destructive agents. In several cases, *e.g.* the plague flea, the characters are too briefly given to be of much service.

The fullest accounts are those of mosquitoes and house-flies. The author describes his successful attacks on house-flies by means of a solution of sodium arsenite (2 per cent.) and molasses (10 per cent.) in water, and recommends, as the result of his experience, that this solution should be sprayed, every eight or ten days during the fly season, on plants near houses and on manure-heaps, and that bunches of straw or twigs should be dipped in the solution and hung up outside houses near the doors and windows.

A short final chapter is devoted to spiders, scorpions, pseudoscorpions, and acari, which attack some of the pests before-mentioned.

There are a hundred figures in the text. The legend of Fig. 24 is misleading; the figure represents the head of a larval Simulium, not, as stated, the head of a larval mosquito.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

On an Appearance of Colour Spectra to the Aged.

DURING the latter months of my eighty-ninth year my attention became directed to a circular colour spectrum which appeared to surround any bright light to which my eyes were directed. The condition was new to me. I had never read of its occurrence, and had never heard it complained of by a patient; but on making inquiry of two distinguished ophthalmologists of large experience I found that they had been consulted in similar cases, one of them only by octogenarians, while both mentioned examples in which the appearance had excited grave apprehension and distress. But nothing, so far as I can ascertain, has appeared in print upon the subject; and I am inclined to attribute my own lack of experience with regard to it to the fact that I retired from practice fifteen years ago, and that domestic lighting by electricity, which supplies conditions very favourable to the production of the appearance in question, has in the meantime become increasingly prevalent. I will endeavour to describe what I see.

If I look steadily at an ordinary electric filament light, about 10 ft. distant from my eyes, it appears to be surrounded by a vivid colour circle about 2 ft. in diameter, with the red band external, the blue internal, the yellow intermediate. The band appears to be about 6 in. in width, so as to be quite clear of the light itself, from which its inner margin appears to be about 6 in. distant. If I light a wax match and hold it in my hand, the colour circle around the flame appears to be about as large as a florin, while that around a full moon is very large and of very brilliant colours. The appearance is most striking when the light is near enough to be vivid, and yet distant enough to fall upon the eye in a slightly divergent pencil, a result well obtained by seeing in a mirror, at 10 ft. from my eyes, the reflection of an electric lamp 10 ft. from the mirror. This arrangement furnishes a circle about 3 ft. in diameter, both larger and better coloured than if I look directly at the lamp itself.

I do not think that the optical condition of my own eyes has any bearing upon the matter, as the presence or absence of spectacles makes no appreciable difference of luminosity or of colour; but the facts are that my right eye has a total H. of 2 D., with 1 D. more in a nearly horizontal diameter, and my left a total H. of 2·50 D., with 1·50 more in a similar diameter. For the last forty years I have constantly worn fully correcting spectacles, with an increase in the lower halves of the lenses for presbyopia, as it gradually became established, and my vision is, and always has been, perfect. I watch with pleasure the evolutions of distant and lofty aeroplanes, and I read "brilliant" type with facility.

If a strong light is brought sufficiently near my eyes to produce active contraction of the pupils the colour circle does not appear, but it springs into existence as the light is moved a few feet away and the pupils are suffered to expand. In like manner, the colour circle is obliterated when I look at the moderately distant light through a pinhole opening in a card or thin metal disc. The facts appear to be that when the eye receives only a small pencil of nearly parallel rays these are sufficiently refracted in the ocular media to be united in a focus upon the yellow spot. When it receives a larger pencil, the outer portions of which will be

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more or less divergent, these portions are not sufficiently refracted to unite upon the centre, but reach the surrounding parts of the retina in the order of their refrangibility, red external, blue internal, yellow intermediate.

The cause of the colour phenomena, therefore, is diminished refracting power of some of the ocular media, and in this relation it is natural to think first of the crystalline lens, on account both of the complexity of its structure and of the well-known fact that it is liable not only to lose its transparency and elasticity in old age, but also to acquire a yellowish or brownish tint. It has been assumed, but, so far as I know, without evidence, that such colour changes are of almost normal occurrence in old age; and, some eighty years ago, an ingenious quack traded upon the suggestion that they were not only normal, but also useful, and placed upon the market, at a high price, spectacle lenses professedly made of clear amber and supposed to be highly advantageous to old people. More recently Dr. Liebreich amused the Royal Institution by a lecture in which he maintained that the peculiarities of Turner's later colouring were due to the gradually deepening yellow of his crystalline lenses. I have, of course, removed many yellow or brown lenses in cases of senile cataract; but I know of no evidence that the healthy lens of an accurately seeing eye changes its colour with age, and I believe that my own perception of all shades of colour remains entirely accurate, and affords satisfactory evidence of complete lenticular colourlessness and transparency.

The vitreous body does not, I think, either display any change of colour as an incident of advancing life, or take any active part in refraction, and my observations lead me, at least in my own case, to dismiss the corneæ from consideration. My spectrum rings are too constant, and too uniform in size, constitution, and colour, to be due to a structure liable to be affected by atmospheric, secretory, or compressive changes. I have kept my eyes open as long as possible, have compressed them with and through my eyelids, have rubbed the eyelids themselves, but, whatever I do, the colour rings remain unaltered. In a word, I have fallen back upon the lenses themselves as the immediate causes of the phenomena, and the question that next arises is whether these phenomena justify any apprehension of diminution or loss of lenticular transparency—in other words, of cataract. I think not. I have carefully examined my own eyes by looking at various sources of light, and at white clouds, through minute slits or minute circular openings in metal discs, and I do not discover any traces of striæ of opacity. The usual shadows are cast upon the retina by minute cells or particles in the ocular media—the shadows so minutely described by the late Dr. Jago in his book on "Entoptics"—but beyond these there is nothing.

I have come to regard the colour rings mainly as an accidental result of unimportant lenticular conditions, the effects of which are intensified by the use of electric light, and which may be dismissed from consideration so far as the quality or the maintenance of vision is concerned. They appear only when the gaze is directed towards the luminosity furnishing them; and they may, I think, be wholly disregarded. I shall be happy if my experience can afford relief from anxiety to any contemporary or other person to whom such rings may have caused uneasiness. R. BRUDENELL CARTER.

An Optical Phenomenon.

THE phenomenon described by Capt. C. J. P. Cave (NATURE, October 18, p. 126) is one of the many instances which support Hering's "Theory of the Processes in Living Substance." According to this theory every kind of living substance is subject to two reciprocal forms of change, the one constructive or "assimilative," the other destructive or "dissimilative." (These terms are nearly synonymous with Gaskell's more characteristic, though not quite classical terms, "anabolic" and "katabolic.") Every effective stimulus causes one or other of these changes, and at any given instant the living substance is in a state of unstable balance between the two, like a flying animal or machine between the force of gravity and the lifting force. *On the cessation or diminution of any stimulus, the living substance tends to return towards the state of balance from which that stimulus changed it.*

The theory applies especially to the very unstable substances of muscle, nerve, and sense-organ. Now, if an effective stimulus be removed from a sense-organ, the return of the sensitive substance towards the former state of balance, being a reciprocal change, produces a reciprocal sensation if such be possible, as when the removal of a hot body from the skin causes a sensation of cold, or the removal of a coloured object from the field of vision causes an after-image of the complementary colour. So the cessation of the stimulus of a moving image on the field of vision causes reciprocal changes (of complex character, no doubt) in the nerve-tissues concerned, which are interpreted at headquarters as reciprocal motion.

An English translation (by Miss F. A. Welby) of Hering's paper describing this most interesting and important theory may be found in *Brain*, 1897, p. 232.

F. J. ALLEN.

Cambridge, October 20.

Native Grasses of Australia.

I REGRET that in my "Age of Mammals," published in 1910, the statement is erroneously made that native grasses are absent from Australia. I am unable to find my authority for this statement, and I regret that it has been quoted in a recent text-book of geology by my friend, Prof. H. F. Cleland.

Prof. E. W. Berry, botanist at Johns Hopkins University, informs me as follows:—"There are certainly plenty of native grasses in Australia; in fact, there is quite a large number of genera confined to that country or to Australia and New Zealand, which is unusual for this group, since grasses, as shown by their present distribution, are an old stock, and enjoyed a nearly world-wide radiation probably as early as the Upper Cretaceous. Possibly the multiplication of turf-forming species was not accomplished until the progressive desiccation of the climate in certain areas at a later time, and I think that this distinction has been more or less overlooked. Some of the genera of grasses confined to Australia are:—Neurachne, Plagiosetum, Xerochloa, Potamophila, Microlæna, Tetrarrhena, Amphipogon, Echinopogon, Dichelachne, Diplopogon, Pentapogon, etc."

HENRY FAIRFIELD OSBORN.

The American Museum of Natural History,
New York, September 27.

Vegetable Pathology and the Vicious Circle.

IN animal pathology disease is frequently complicated by reactions which aggravate the primary morbid process, and so establish what is known as a "vicious circle." This process *vires acquirit eundo*, and may lead to the perpetuation of disease, to the destruction of an organ, or even to the termination of life. I should be glad to know whether any examples of such "vicious circles" are met with in vegetable pathology.

JAMIESON B. HURRY.

Westfield, Reading, October 26.

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